paratively little known to that class of the community with which I have so much sympathy, the ordinary British tourist. These flock every year in hundreds to Algeria and Tunis, but few of them visit the splendid Roman remains in the interior of those countries. The Cyrenaica is not so easily accessible, and I doubt whether any Englishmen have travelled in it since the exploration of Smith and Porcher in 1861.

Cyrene almost rivalled Carthage in commercial importance. The Hellenic ruins still existing bear witness to the splendour of its five great cities. It was the birthplace of many distinguished people, and amongst its hills and fountains were located some of the most interesting scenes in mythology, such as the Gardens of the Hesperides, and the "silent, dull, forgetful waters of Lethe."

This peninsula is only separated by a narrow strait from Greece, whence it was originally colonized. There, and indeed all over the eastern basin of the Mediterranean, are many little-trodden routes; but the subject is too extensive; I am reluctantly compelled to restrict my remarks to the western half.

The south of Italy is more frequently traversed and less travelled in than any part of that country. Of the thousands who yearly embark or disembark at Brindisi, few ever visit the Land of Manfred. Otranto is only known to them from the fanciful descriptions in Horace Walpole's romance. The general public in this country is quite ignorant of what is going on at Taranto, and of the great arsenal and dockyard which Italy is constructing in the Mare Piccolo, an inland sea containing more than 1000 acres of anchorage for the largest ironclads afloat, yet with an entrance so narrow that it is spanned by a revolving bridge. Even the Adriatic, though traversed daily by steamers of the Austrian Lloyd's Company, is not a highway of travel; yet where is it possible to find so many places of interest within the short space of a week's voyage, between Corfu and Trieste, as along the Dalmatian and Istrian shores, and among the islands that fringe the former, where it is difficult to realize that one is at sea at all, and not on some great inland lake?

There is the Bocche di Cattaro, a vast rent made by the Adriatic among the mountains, where the sea flows round their spurs in a series of canals, bays, and lakes of surpassing beauty. The city of Cattaro itself, the gateway of Montenegro, with its picturesque Venetian fortress, nestling at the foot of the black mountain, Ragusa, the Roman successor of the Hellenic Epidaurus, Queen of the Southern Adriatic, battling with the waves on her rock-bound peninsula, the one spot in all that sea which never submitted either to Venice or the Turk, and for centuries resisting the barbarians on every side, absolutely unique as a mediæval fortified town, and worthy to have given her name to the argosies she sent forth; Spalato, the grandest of Roman monuments; Lissa, colonized by Dionysius of Syracuse, and memorable to us as having been a British naval station from 1812 to 1814, while the French held Dalmatia; Zara, the capital, famous for its siege by the Crusaders, interesting from an ecclesiological point of view, and venerated as the last resting-place of St. Simeon, the prophet of the *Nunc dimittis*; Parenza, with its great basilica; Pola, with its noble harbour, whence Belisarius sailed forth, now the chief naval port of the Austrian Empire, with its Roman amphitheatre and graceful triumphal arches; besides many other places of almost equal interest. Still further west are Corsica, Sardinia, and the Balearic Islands, all easily accessible from the coasts of France, Italy, and Spain. Their ports are constantly visited by mail-steamers and private yachts, yet they are but little explored in the interior.

A physical and historical description of Corsica was then given. The address concluded as follows:—

I have endeavoured to sketch, necessarily in a very imperfect manner, the physical character and history of the Mediterranean, to show how the commerce of the world originated in a small maritime State at its eastern extremity; how it gradually advanced westward till it burst through the Straits of Gibraltar, and extended over seas and continents until then undreamt of, an event which deprived the Mediterranean of that commercial prosperity and greatness which for centuries had been limited to its narrow basin.

Once more this historic sea has become the highway of nations; the persistent energy and genius of two men have revolutionized navigation, opened out new and boundless fields for commerce; and it is hardly too much to say that if the Mediterranean is to be restored to its old position of importance; if the struggle for Africa is to result in its regeneration, as happened in the New World; if the dark places still remaining in the further East are to be civilized, it will be in a great measure due to Waghorn and Ferdinand de Lesseps, who developed the overland route and created the Suez Canal.

But the Mediterranean can only hope to retain its regenerated position in time of peace. Nothing is more certainly shown by past history than that war and conquest have changed the route of commerce in spite of favoured geographical positions. Babylon was conquered by Assyrians, Persians, Macedonians, and Romans, and though for a time her position on the Euphrates caused her to rise like a Phœnix from her ashes, successive conquests, combined with the luxury and effeminacy of her rulers, caused her to perish. Tyre, conquered by Nebuchadnezzar and Alexander, fell as completely as Babylon had done, and her trade passed to Alexandria. Ruined sites of commercial cities rarely again become emporia of commerce; Alexandria is an exception dependent on very exceptional circumstances.

The old route to the East was principally used by sailing-vessels, and was abandoned for the shorter and more economical one by the Suez Canal, which now enables a round voyage to be made in sixty days, which formerly required from six to eight months. This, however, can only remain open in time of peace. It is quite possible that in the event of war the old route by the Cape may be again used, to the detriment of traffic by the Mediterranean. Modern invention has greatly economized the use of coal; and steamers, by the use of duplex and triplex engines, can run with a comparatively small consumption of fuel, thus leaving a larger space for cargo. England, the great carrying Power of the world, may find it more advantageous to trust to her own strength and the security of the open seas than to run the gauntlet of the numerous strategical positions in the Mediterranean, such as Port Mahon, Bizerta, and Taranto, each of which is capable of affording impregnable shelter to a hostile fleet, and though the ultimate key to the Indian Ocean is in our own hands, our passage to it may be beset with a thousand dangers. There is no act of my career on which I look back with so much satisfaction as on the share I had in the occupation of Perim, one of the most important links in that chain of coaling stations which extends through the Mediterranean to the further East, and which is so necessary for the maintenance of our naval supremacy. It is a mere islet, it is true, a barren rock, but one surrounding a noble harbour, and so eminently in its right place that we cannot contemplate with equanimity the possibility of its being in any other hands than our own.

It is by no means certain whether exaggerated armaments are best suited for preserving peace or hastening a destructive war; the golden age of disarmament and international arbitration may not be near at hand, but it is even now talked of as a possibility. Should the poet's prophecy or the patriot's dream be realized, and a universal peace indeed bless the world, then this sea of so many victories may long remain the harvest field of a commerce nobler than conquest.

NOTES.

The Kew Herbarium has just been enriched by a set of the dried plants from the extensive collections made by Regel, Przewalski, Potanin, and other recent Russian travellers in Central and Eastern Asia. This valuable set numbers about 2600 species, including very many novelties, and it was presented to the Royal Gardens, Kew, through the good offices of Dr. A. E. von Regel, Director of the Imperial Botanic Garden at St. Petersburg, and Mr. C. J. Maximowicz, the Curator of the Herbarium in the same establishment.

A laboratory for plant-biology has been recently opened at Fontainebleau. It is under the direction of M. Bonnier, Professor of Botany at the Sorbonne in Paris, to whom application should be made by any contemplating research there.

Dr. William Waagen, F.G.S., formerly Palæontologist to the Geological Survey of India, and of late years Professor of Geology at Prague, has been appointed Professor of Palæontology to the University of Vienna, in succession to the late Dr. Neumayr.

In a "Supplement to the Catalogue of Diurnal Accipitres in the Australian Museum at Sydney, N.S.W.," Dr. E. P. Ramsay gives descriptions of many plumages of birds of prey not previously recorded. The nestlings described have been preserved for the Museum by Mr. K. H. Bennett, and include those of the rarest of the Australian accipitres. The colours of the soft parts have been most carefully noted, and are deemed in one instance (*Aquila morphnoides*, p. 7) to be worthy of a duplicate reproduction by Dr. Ramsay.

The Rev. Dr. Norman has just returned from a dredging expedition in the Varanger Fiord and Sydvaranger. He has been absent nine weeks, and has brought home extensive collections in all branches of Marine Invertebrata. The fiords of Sydvaranger were found to possess a rich fauna, with depths descending to 120 fathoms. These fiords had never before been scientifically investigated, though Baron de Guerne took a few hauls of the dredge there in 1881 when on board the French vessel *Coligny* as a member of the Mission Scientifique en Laponie, and published a list of the Mollusca obtained.

Dr. Ramsay has also compiled a catalogue of the Striges in the Australian Museum, which appears to possess a good series of every species known to inhabit Australia and the adjacent islands, with the exception of *Ninox ocellata* and *Ninox rufa*, the latter being a good species in Dr. Ramsay's opinion, though Mr. Sharpe considered it to be the young of *N. connivens*. It is to be hoped that Dr. Ramsay will continue his useful catalogues of the specimens of birds in the Australian Museum.

Dr. J. B. Steere has just published his preliminary descriptions of new species discovered by the members of the expedition to the Philippine Islands. It is to be hoped that a complete memoir on this important exploration will be published later on, as the diagnoses set forth in the little *brochure* just issued are, in many cases, worse than useless.

In the *Times* for September 9 we read the following note on "How to keep salt dry"—"The Dutch Indian Government offers a prize of 10,000 fl. for the best practical answer to the question in what manner the salt which is sold in Dutch India in small packets should be packed up so as to keep dry."

We have received the general Guide to the Science and Art Museum, Dublin, under the directorship of V. Ball, LL.D., F.R.S. The Museum is divided into two parts. Part I., which is in the old museum buildings, deals with natural history, while Part II. treats of arts and industry, and is in the new buildings. In this Museum there are short printed labels attached to the specimens, and for the more important objects, descriptive tables containing "greater detail than even an ordinary hand-book could conveniently contain" are added. In some cases small maps are attached, indicating the localities where the objects were found. In this edition, which by the way is the first issued, the several branches of the collections are dealt with generally, and we are told that "hand-books will be prepared later on for some of them," which will add greatly to the interest of the objects concerned.

The Observatory of Zi-ka-Wei, near Shanghai, has published vol. xv. of its *Bulletin Mensuel*, for the year 1889. This Observatory is equipped with the best self-recording and other instruments, and the volume in question contains, in addition to the usual tables of hourly observations, diagrams of the mean diurnal variations, and of the tracks of typhoons, as well as comparisons of the monthly means of magnetical and meteorological observations for the year 1889, and those of the previous 17 years. An appeal was made to the missionaries of the province of Kiang-nan to record thunderstorm observations, and some interesting results are published for each month. These storms occur most frequently between noon and midnight, and generally proceed from west to east; they mostly occur in July and August; there is also a second maximum in April; they most frequently occur with a falling barometer, and are generally accompanied with rain, but very rarely with hail. The work also contains interesting general remarks upon the depressions and cyclones of the coast of China.

The Journal of the Asiatic Society of Bengal, three numbers of which we have received, contains some interesting papers on various subjects. In No. 1, Part 2 of vol. lix. there is a paper by John Eliot on the occasional inversion of the temperature relations between the hills and plains of Northern India. Alfred Alcock, Surgeon-Naturalist to the Marine Survey, contributes a paper on observations on the gestation of some sharks and rays, made on board H.M. Indian Marine Survey steamer *Investigator*, Commander Alfred Carpenter, R.N., while from the same ship we have descriptions of seven additional new Indian Amphipods by G. M. Giles, late Surgeon-Naturalist to the Survey. Asutosh Mukhopadhyay contributes three papers, as follows:—Note on Stokes's theorem and hydrokinetic circulation; on Clebsch's transformation of the hydrokinetic equation; and on a curve of aberrancy. The supplement to No. 1 of this part consists of a catalogue of the Insecta of the Oriental region and the order of Coleoptera, family Carabidæ, by E. T. Atkinson. The third pamphlet contains the title-page, index, &c., to vol. lvii. Part 2, 1888.

The *American Meteorological Journal* for August contains the conclusion of M. Faye's articles on Trombes and Tornadoes. The author considers that the facts adduced show (1) that there are no centripetal movements, either at the foot of trombes or tornadoes, or toward the base of cyclones; (2) that these are descending whirls with vertical axes, originated in the upper currents of the atmosphere, and follow the direction of these currents. The same journal contains the tornado prize essays. The first prize has been awarded to Lieutenant J. P. Finley. The following are some of the general results arrived at:—Tornadoes generally accompany an area of low barometer. Their progressive motion to the north-east arises from the fact that as they always form in the south-east quadrant of an area of low barometer, they must come within the influence of the general drift of the atmosphere on that side of the low barometer which is always to the north-east. A hailstorm is an incipient tornado in the cloud-region of an area of low barometer. As the area of low barometer progresses eastward, the region lying on an average about 350 miles to the south and east of the centre of the general storm, is the region within which tornadoes may be expected. Tornadoes, with hardly an exception, occur in the afternoon, just after the hottest part of the day; the destructive power of the wind increases rapidly from the circumference of the storm to its centre. The months of greatest frequency, as determined from a period of over 200 years, are April to July; the average frequency of the storms does not appear to have changed within that time. The shortest time occupied by the tornado-cloud in passing a given point varies from an instant to about twenty minutes, the average time being 74 seconds. The second prize was awarded to Mr. A. McAdie.

A new method of measuring the inductive power and conductivity of dielectrics has been recently described by M. Curie in the *Annales de Chimie et de Physique*; it is based on the use of an apparatus he calls the piezo-electric quartz. He has studied with it those qualities in various crystalline dielectrics; and he enunciates a *law of superposition*, which shows the independence of the effects produced by different variations of electromotive force. Quartz shows a difference of conductivity in the direction of the optic axis (where it is strong), and at right angles (where it is insensible); and this gives rise to striking phenomena. Plates parallel to the axis, and with the extremities of the axis communicating with the earth, behave, beyond 120°, as dielectrics of zero inductive power. With prolonged heating, the conductivity along the axis quite disappears. Water plays a capital *rôle* in the conductivity of a great many dielectrics (possibly in all). With plates of baked porcelain kept moist the various types of conductivity could be reproduced. The electromotive forces of polarization of moist porous bodies may attain several hundred volts.

Prairie dogs, it appears from a recent letter by Dr. Wilder to *Science*, lack the sense of distance. At Cornell University, several individuals walked off chairs, tables, and window-sills unhesitatingly. This is thought to be due to the nature of their usual habitat, a plain, with no sharper inequalities than burrows and mounds. One adult female seemed to have wonderful immunity from the ill-effects of falls: it once fell from the top of an elevator 21 feet high, and another time from a window-sill, about as high, on a granite pavement, but soon recovered. These animals respond to sudden sound by erecting the body and barking, and the nervous mechanism involved seems to be largely reflex, rapidly exhausted, but nearly or quite uncontrollable; indeed, one of those falls seems to have been due to an unguarded erection of the body on hearing a large clock strike.

The additions to the Zoological Society's Gardens during the past week include a Rhesus Monkey (*Macacus rhesus* ♂) from India, presented by Mr. Jesser Coope, F.Z.S.; a Nightingale (*Daulias luscinia*), British, presented by Mr. J. Young, F.Z.S.; two Green Doves (*Chalcophaps indica*) from Ceylon, presented by Mrs. Thompson; a Common Chameleon (*Chamæleon vulgaris*) from North Africa, presented by Master E. S. Forwood; two Short-tailed Wallabys (*Halmaturus brachyurus*) from Australia, received in exchange; a Brown Capuchin (*Cebus fatuellus* ♂) from Brazil, a Squirrel Monkey (*Chrysothrix sciurea*) from Guiana, a Banksian Cockatoo (*Calyptorhynchus banksii*) from New South Wales, deposited; two Red-vented Bulbuls (*Pycnonotus hæmorrhous*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

Objects for the Spectroscope.

Sidereal Time at Greenwich at 10 p.m. on September 11 = 21h. 24m. 28s.

Name.	Mag.	Colour.	R.A. 1890.	Decl. 1890.
			h. m. s.	° ′
(1) G.C. 4600	—	—	20 41 7	+30 19
(2) D.M. + 44° 3877 ...	6·7	Reddish-yellow.	21 31 51	+44 53
(3) 2 Pegasi	4·5	Yellowish-red.	21 24 58	+23 10
(4) δ Equulei	4·5	Whitish-yellow.	21 9 6	+ 9 34
(5) α Equulei	4·0	White.	21 10 18	+ 4 45
(6) 238 Schj.	7·4	Yellowish-red.	20 10 40	−21 35
(7) S Vulpeculæ	Var.	Yellow-red.	19 43 53	+27 1

Remarks.

(1) In the General Catalogue this nebula is described as "a very remarkable object; pretty bright; considerably large; extremely irregular figure; *k* Cygni involved." The spectrum, as observed by Dr. Huggins, is a continuous one with a suspicion of an unusual brightness in the region beyond F. The excess of blue light is probably due to the radiation of some substance, most likely carbon, added to a dim and short continuous spectrum. The green flutings would in that case be masked by continuous spectrum, and the result would be a spectrum apparently continuous in the green and discontinuous in the blue. This discontinuity should be looked for in the nebula spectrum, and comparisons made with the carbon flutings.

(2) This star has a spectrum of Group II. "of extraordinary beauty," all the bands 1–9 being very wide and very dark (Dunér). It is probably a star of mean condensation, and the bright carbon flutings should therefore be well seen.

(3) The spectrum of this star may advantageously be studied in connection with the observations of stars which have a spectrum hitherto described as of the solar type. It is one of a very late stage of Group II., the distinctive dark bands being very narrow, so that the spectrum approaches one of Group III. The *lines* which are seen at this stage will in all probability be continued to Group III. stars, and will therefore serve as criteria for distinguishing between stars of Group III. and stars of Group V.

(4) Vogel writes the spectrum of this star as II.*a* (I.*a*), which means that the star is either at a late stage of Group III., or an early one of Group V. Its precise position on the "temperature-curve" may be determined by reference to the criteria mentioned in the note on (3).

(5) The spectrum of this star is one of Group IV.

(6) Although this star is far from being a faint one compared with many other stars of Group VI., very few details have been observed in its spectrum, either by Secchi or Dunér. Dunér simply states that the spectrum consists of three zones, the blue being very weak. The intensity of band 6 (λ 564) relatively to band 9 (λ 517), and other details, should be noted.

(7) This is a variable of Group II. of very small range and short period. The mean magnitude at maximum is about 8·85, and that at minimum 9·95. The mean period is about 67·8 days, and the increase to maximum is much more rapid than the decrease to minimum, the former occupying 20·6 days, and the latter 47·2. According to Dunér, the spectrum is only feebly developed, and this is exactly what it should be if Mr. Lockyer's view as to the constitution of this class of bodies be correct. The central swarm being well advanced in condensation, only revolving swarms of short period will be effective in producing changes of light, because long period swarms will pass clear of the central swarm at periastron. It is only to be expected, therefore, that a well advanced, or "feebly-developed" spectrum should be associated with a short period in variables of Group II. Under these circumstances it is not likely that bright hydrogen lines will appear at maximum, but an observation of their absence will be of value, and other variations may occur. There will be a maximum about September 15.

A. Fowler.

Observations of the Companions to Brook's Comet (V. 1889).—Mr. E. E. Barnard, in *Astronomische Nachrichten*, No. 2988, gives the physical and micrometrical observations of the companions to this comet made with the 12-inch and 36-inch refractors of the Lick Observatory, and those made elsewhere. It will be remembered that Mr. Barnard discovered two companions to Brook's comet on August 2, 1889, and two others on August 5. His remarks on the appearance of the companions, and the physical changes which they underwent from the date of discovery, until they disappeared from sight, are very important. Two of the companions seemed to undergo the same process of disintegration. Beginning with a nucleus and a tail, each became enlarged, diffused, and fainter, until it had dissipated into space. In some concluding remarks Mr. Barnard writes: "I have no doubt but that the great telescope would readily reveal more unknown nebulæ than the entire number now contained in the latest catalogue of Dreyes," and the number of unknown nebulæ incidentally found by him during these observations supports this assertion.

Parallax of β Orionis.—In the *Observatory* for September, Dr. Gill has a note on the parallax of β Orionis. The star is situated near one corner of the nebulous area encircled by α Orionis, Lalande 11382, Lalande 11329, ω Orionis, ψ Orionis, and β Eridani, and the observations show that it has a negative parallax of about 0″·17 relative to the near parallax of the stars D.M. − 7° 997 and − 8° 1078, and therefore belongs to a more distant system. It also results from the calculations that the former star and θ Orionis are members of an immensely more remote system than the latter one. The reductions were suggested by an examination of a photograph of the region about the Orion nebula taken under the direction of Prof. E. C. Pickering.

Carl Frederik Fearnley.—The death of this eminent Norwegian astronomer occurred on the 23rd ult. at Christiania. He was born at Frederikshald on December 19, 1818. In 1844 he became attached to the Observatory of Christiania University as an assistant, and since 1861 has been the Director. He was made a Professor of Astronomy in 1857.